

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 830. (No. 47, Vol. XVI.)

NOVEMBER 20, 1924

Weekly, Price 6d.
Post free, 7d.

Flight

The Aircraft Engineer and Airships

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.

Telegrams: Truditur, Westcent, London. Telephone: Gerrard 1828

Annual Subscription Rates, Post Free:

United Kingdom .. 30s. 4d. Abroad .. 33s. 0d.*

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates

* European subscriptions must be remitted in British currency

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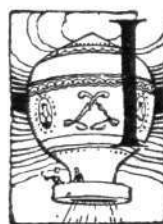
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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1924	
Nov. 21	Dr. A. P. Thurston, M.B.E., F.R.Ae.S., M.I.A.E., Hons. Member: "Graphic Methods of Aircraft Structural Design," before I.Ae.E.
Nov. 26	Lt.-Comdr. S. E. Deacon, R.N.: "The Air Port of Croydon," before Cambridge Univ. Ae.S.
Nov. 27	Dr. G. C. Simpson, C.B.E., F.R.S. (Director, Meteorological Office): "Thunderstorms," before R.Ae.S.
Dec. 4	Colonel F. Searle, C.B.E., D.S.O. (Managing Director, Imperial Airways, Ltd.): "The Maintenance of Commercial Aircraft," before R.Ae.S.
Dec. 5-21	Paris Aero Show.
Dec. 12	Commander J. C. Hunsaker (C.C.), U.S.N., Assistant Naval Attaché to the American Embassy, London: "Notes on Seaplane Design," before I.Ae.E.
Dec. 18	Mr. A. R. Watson Watt (Superintendent, Radio Research Board Station): "Recent Studies on Radiotelegraphic Atmospherics," before R.Ae.S.

EDITORIAL COMMENT.



Starting in Real Earnest

It may, perhaps, be taken as being significant that the first public official act of Sir Samuel Hoare, Secretary of State for Air, on resuming office was a visit of inspection to the airship base at Cardington, giving an indication, not only of the importance which the new Air Minister attaches to airship development, but of a determination to lose no time in getting to work in real earnest. In a short speech, made on the occasion of the visit, Sir Samuel admitted that he had always thought the absence of an airship policy was a serious gap in our aeronautical development, and it may, therefore, be taken for granted that from now onwards there will be no undue delay in airship progress. We were extremely glad to find that the keynote of further airship work is to be "caution." Sir Samuel said that they were very conscious of the fact that in the past there had been many airship disasters, and they were determined to check each constructional step in every way possible as it was made, the main object always being to make sure, if somewhat slow, progress.

Certainly such information as was allowed to become known on the visit to Cardington tends to reassure one in this respect. We have repeatedly urged in FLIGHT that a very great deal of research and experimental work is necessary if airships of five million cubic feet capacity are to be built with reasonable assurance that they will incorporate no untried or uncertain features. The manner in which R.33 is being overhauled and fitted out for full-scale tests gives an indication of the thoroughness with which the subject is being approached, and if the actual erection of the new airships is delayed until the fullest data have been compiled from flying tests with the older airships, research work in the laboratories on aerodynamical as well as metallurgical problems, it should be possible to ensure that when our two new airships leave their sheds they are, although nearly twice as large as any airship built hitherto, as scientifically designed and structurally strong as human skill can make them.

The announcement that the R.101 (why R.101, by the way?) is to have steel girders will probably come as somewhat of a surprise. Hitherto the materials employed in airship construction have been mostly Duralumin or wood, the Zeppelin company having always specialised in the former, while the Schutte-Lanz firm did some very wonderful work with the latter in the form of three-ply. It is to be assumed, of course, that as the size of airships increases so the employment of steel becomes more and more a practical proposition. At any rate, the change from Duralumin to steel is a most interesting innovation. It is, of course, not to be doubted that the fullest experiments with sections of girders will be made so as to ascertain beforehand exactly what strength any given girder may be assumed to have in any particular part of the structure, and the tests to be made with R.33 in order to determine the air pressures and stresses in various parts of the airship, should go a long way to fill such gaps as still exist in our knowledge of the subject.

Considerable satisfaction will doubtless be felt at the decision to fit R.101 with heavy-oil semi-Diesel engines. In view of the progress made by the Beardmore firm in this direction, it appears fairly certain that this will be the type of engine employed, and apart from the increased safety from fire, which the use of heavy oil in place of petrol should bring with it, considerable economy should be effected by using a fuel cheaper than petrol. While on the subject of

fire risk we would draw attention to a communication from Commander Boothby, which we publish elsewhere in this issue of FLIGHT. In his opinion, and it is, we believe, shared by many airship experts, the protection which an inert gas surrounding the gas bags affords is such as to render it almost imperative to incorporate this feature in the design. We do not know how much extra weight the arrangement would entail, but if it has the efficiency claimed for it by its advocates it would seem worth while to employ it, even at the sacrifice of a certain amount of paying load.

We have got to make airships pay, certainly, but above all we have to make them safe. Once that is accomplished and the confidence of the public has been gained, the question of commercial economy will largely solve itself by the extra amount of traffic that can be attracted to this mode of travel.

If, as Sir Samuel Hoare indicated, no effort is to be spared to attain safety above all else, we can foresee a brilliant future for airships, but if the support given by the Government to research, which is necessarily costly, is to be of the half-hearted cheese-paring sort to which we have been accustomed in the past, then there is a very grave danger that history will repeat itself. It comes to this, that we simply cannot afford to risk the new airships being failures. They have got to be successes, whatever the cost and whatever the unavoidable delays in producing them.

A REAL START WITH AIRSHIPS AT LAST

TUESDAY, November 18, 1924, is likely to go down in history as one of the important dates in the progress of aviation, for on that day the airship base at Cardington, near Bedford, was visited by Sir Samuel Hoare, Secretary of State for Air; Sir Philip Sassoon, Under-Secretary of State for Air; and Air Vice-Marshal Sir Geoffrey Salmond, Air Member for Supply and Research, accompanied by members of the newly-appointed airship staff, including Group Captain Fellowes, Squadron-Leader Colmore, Col. Richmond, and Maj. Scott. The visit was the first official act of the new Air Minister and Under-Secretary, and as such was regarded as of considerable importance. The visit marked the first official disclosure of certain details of the Government's new airship policy, and for the first time really authentic information became available concerning the new airship to be built at Cardington under the scheme for the resumption of airship work in Great Britain.

It should be pointed out that although the design for the new Government-built airship (to be known as the R.101, while the airship whose construction has been entrusted to the Airship Guarantee Co. will be known as R.100) is fairly far advanced, no actual constructional work will be commenced for some time, as it is desired to carry out certain tests first with existing airships, to be reconditioned for the purpose, so as to avoid the risk of having to make alterations to a ship already fairly far advanced. Also it will be necessary to increase the size of the shed at Cardington, which is not at present large enough for the building of a five-million cu. ft. airship.

The R.101 will have an overall length of approximately 720 ft., and a maximum diameter of 130 ft. As the airship to be built by the Airship Guarantee Co. is to be but 695 ft. long, and with a diameter of 132 ft., the Cardington ship will have a somewhat larger fineness ratio. The maximum height will be 140 ft. The gas capacity is to be 5,000,000 cu. ft. (140,000 cu. m.). The total lift is to be 155 tons, of which it is expected that approximately 75 tons will be disposable lift. The amount of pay load that can be carried will necessarily depend upon the duration of the journeys to be undertaken, but it is estimated that for the flight to India, with an intermediate landing halfway, say in Egypt, something like 20 tons should be available for passengers and/or goods. An interesting innovation in construction is that the main girders of R.101 will be of stainless steel.

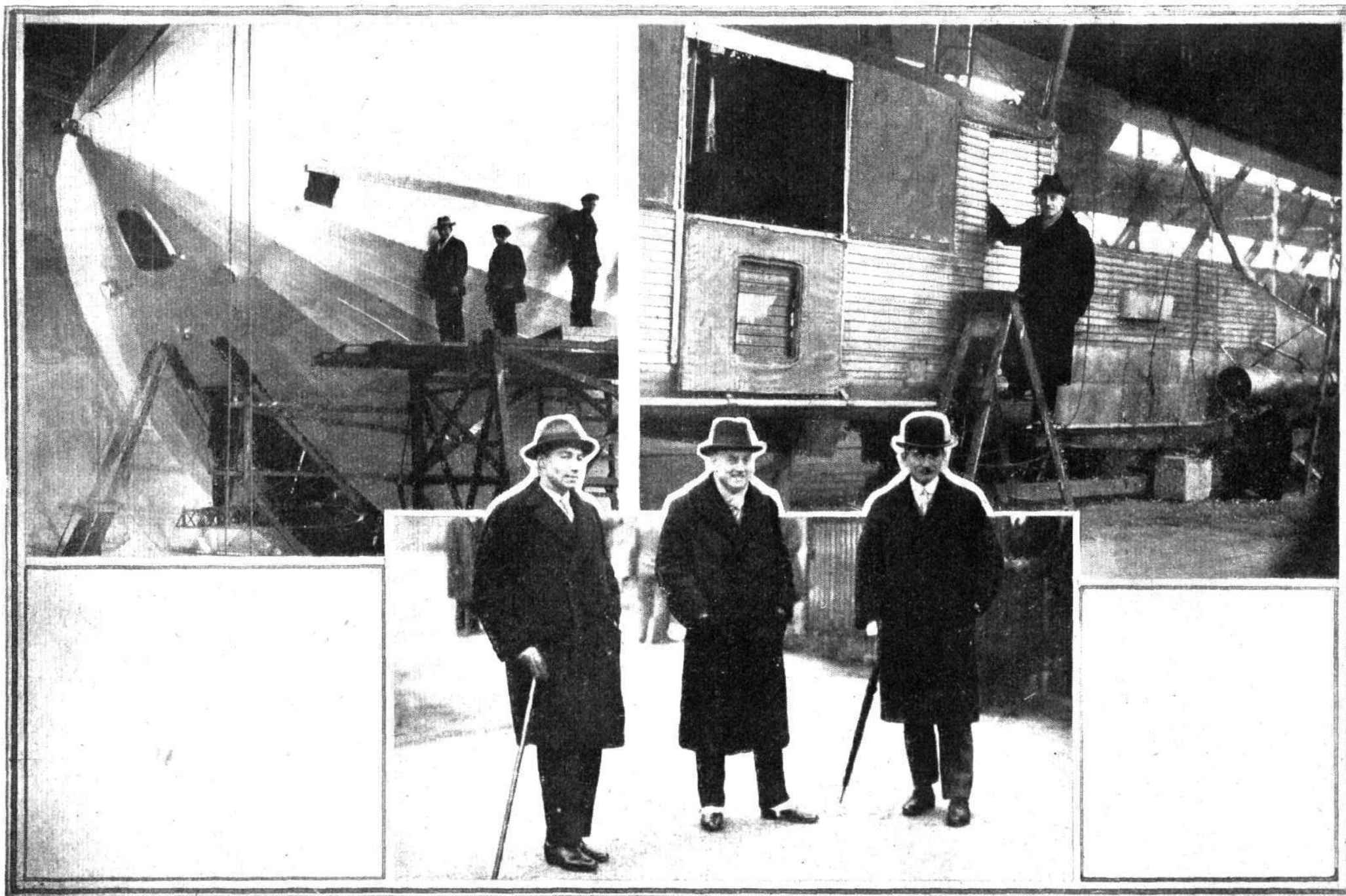
The power plant is to consist of seven engines of 600 h.p.

each, of the semi-Diesel type, and burning heavy oil. In addition to lessening the risk of fire, this type of engine is very economical in fuel, and it has been estimated that the R.101 will consume approximately 1,750 lbs. of fuel per hour while flying at her maximum speed of 70 m.p.h. The equipment for passengers will necessarily depend upon the use to which the airship is put. If used for commercial work about 100 passengers could be carried on a flight to Egypt and India, and in that case suitable passenger accommodation would, of course, be provided.

In addition to the enlarged shed at Cardington, which would form the London base of any regular airship line, a large shed is to be built in India, and mooring masts of new and improved type will be erected at Cardington and in India, as well as one at some intermediate point, probably in Egypt. These masts will be more than 180 ft. high, and will be provided with electric lifts, winches, pumps and mains for supplying the ships with gas, water, and oil.

In order to collect as much information as possible before the large airship is built, the R.33 is being reconditioned at Cardington, and is being fitted out with an elaborate equipment, largely electrical, for the determination of air pressures and stresses set up during fairly violent manoeuvres such as might be necessary in actual flying. These appliances should serve to fill the present gaps in our knowledge of what exactly happens during certain evolutions such as those which caused the collapse of the R.38, and will, it is hoped, serve to avoid any risk of a repetition of that catastrophe. It is expected that the R.33 will be ready for her flying experiments early in the new year, and when sufficient data has been collected with her, the R.36, which is now at Pulham being reconditioned and having her nose strengthened, will be put into commission and sent on an experimental trip to India in order to test the feasibility of regular services with the new and larger airships.

It will thus be seen that everything is being done to ensure that the fullest possible information is available to the designers of the new five-million cu. ft. airships before the construction of these are actually commenced, so that, what with other research work in our laboratories, aerodynamic as well as metallurgical, there should be a very good possibility of making the new giants of the air a success. The date when these will be ready for flight cannot yet be forecasted, but at any rate it seems doubtful whether they will be finished before 1927.



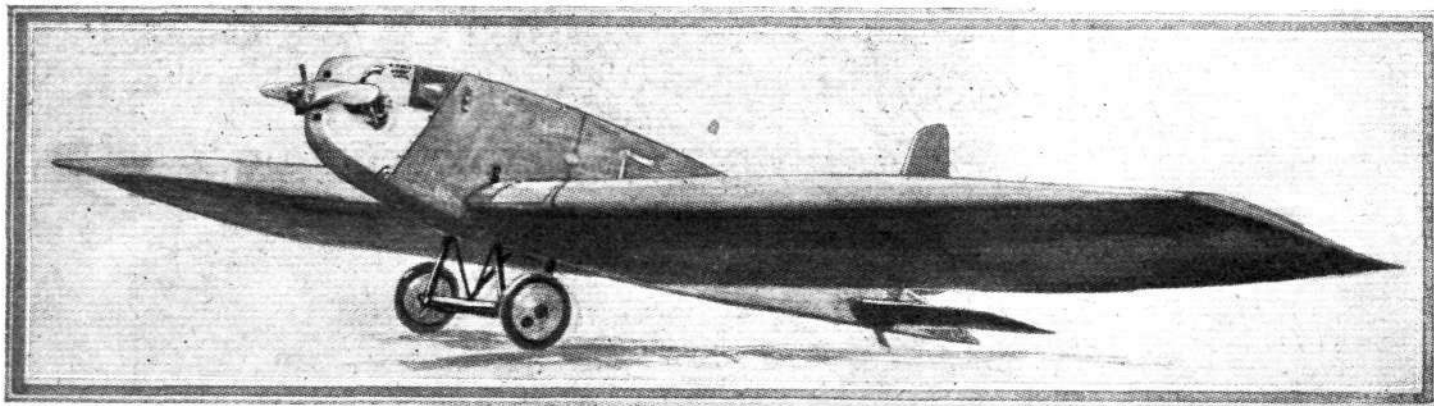
AIR CHIEFS' VISIT TO CARDINGTON : On Tuesday of this week Sir Samuel Hoare, the new Air Minister, paid a visit to the airship base at Cardington, near Bedford. Our photographs show : Above, on the left, the nose of R.33, which is being strengthened for mast mooring. On the right, Sir Samuel Hoare ascending to the control car of R.33 ; and below, Sir Philip Sassoon, Under-Secretary of State for Air, Sir Samuel Hoare, Secretary of State for Air, and Air Vice-Marshal Sir Geoffrey Salmond, Air Member for Supply and Research.

THE CASPAR "C.17" LIGHT MONOPLANE TWO-SEATER

A.B.C. "Scorpion" Engine

SOME months ago we mentioned in *FLIGHT* that the first A.B.C. "Scorpion" for light 'plane use had been sold, and that, curiously enough, it had been sold to a German firm, the Caspar-Werke of Travemünde. The machine for which the "Scorpion" was intended was finished some time ago, and has, we understand, proved to fly quite well with the small British power plant. The "C.17"—as the two-seater light monoplane is called—was designed by the chief designer of the Caspar works, Dipl.-Ing. Ernst Ritter von Loessl, and incorporates several unorthodox features. For the explanation of the objects which the designer had in mind, and

designer in planning his machine, and the decision to make it a low-wing monoplane of high aspect ratio was, of course, the result of a desire for high aerodynamic efficiency. This was essential in order to give the machine, without any undue increase in engine power, a power reserve comparable with that found desirable in commercial aircraft. Constructional details were planned so as to give low production cost, not by building the machine of inferior and cheaper materials, but by simplifying as far as possible the constructional work, reducing the number of parts to a minimum and standardising certain sizes of members for use throughout the machine



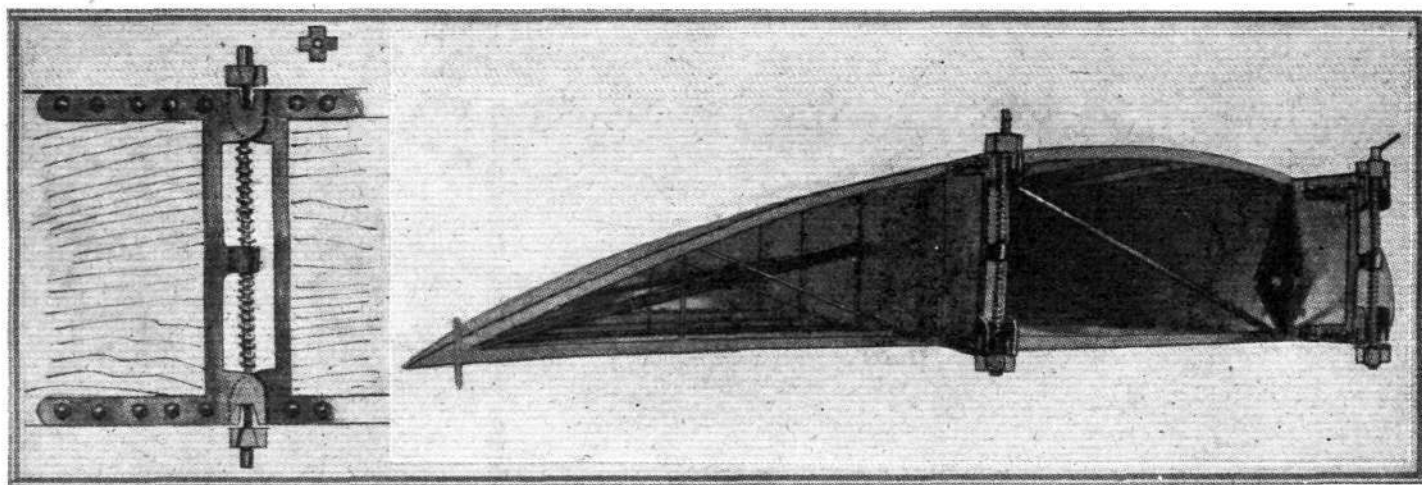
THE CASPAR LIGHT MONOPLANE : Three-quarter front view. The engine is an A.B.C. "Scorpion."

the reasons for some of the arrangements chosen, we are indebted to Herr C. W. Erich Meyer, Editor of *Deutsche Motor-Zeitschrift*, who gives an authoritative analysis of the machine in his journal. Incidentally, it may be mentioned that Herr Meyer, who was, during the War, a member of the famous Richthofen squadron, carried out the test flights on the Caspar "C.17," so that he writes with first-hand knowledge.

The requirements which the designer set out to meet were that the machine should have as nearly as possible the minimum amount of engine power so as to follow in this

(Thus, to take an example, the stringers used in fuselage, tail and wings are all of the same dimensions, and are of triangular section.)

As the accompanying illustrations will show, the Caspar "C.17" low-wing monoplane is of rather typical "German" lines, i.e. the high aspect ratio, large span wing, and very short fuselage are features which one has come to associate with aeroplanes of German origin. In this country the tendency has been rather to lengthen the body so as to get the tail out of the downwash and acting on a longer lever arm. In the Caspar, however, the designer had clearly in mind what



The Caspar light monoplane has its wings flexibly mounted by means of springs so as to take advantage of pulsating winds. The number of ribs has been reduced to a minimum.

respect the experience gained with light 'plane single-seaters. The fuel consumption was to be kept low so that the cost of petrol should not work out at any more, proportionately, for the two-seater than for the single-seater. In spite of this the machine was to have a performance and manœuvrability suitable for school work, sporting flying, and touring. In spite of these somewhat difficult requirements the construction to be adopted was to be such as to make for cheapness, as it was considered that otherwise the whole object of the machine would be defeated.

The requirements briefly set out above influenced the

he wanted to attain, and the short body is not merely a conventional proportion, but has been deliberately chosen. The high aspect ratio was, of course, adopted from considerations of efficiency. It was also desired to make the machine as easy as possible to fly, so that even a pilot of indifferent skill might handle it with comparative safety. In order to attain this end the designer adopted a novel principle of wing attachment by which, under the action of gusts, the wings can adapt themselves to some extent to the new conditions without upsetting the balance of the machine. A glider designed by Herr von Loessl incorporating this

feature was flown in the Rhön by Herr Meyer in 1922, the flexibly-mounted wings being intended to take advantage of the so-called "Knoller-Betz Effect." In the Caspar "C.17," however, the designer has gone a step farther, and has so interconnected the elevator and the wing that the two move in unison, maintaining the trim of the machine under all conditions, and retaining the controllability. These considerations and a desire to make the machine as little prone to spinning as possible are the main reasons for the short fuselage. The wing section also was chosen with a view to helping in this direction, that employed being the "Gottingen No. 348."

Constructional Details

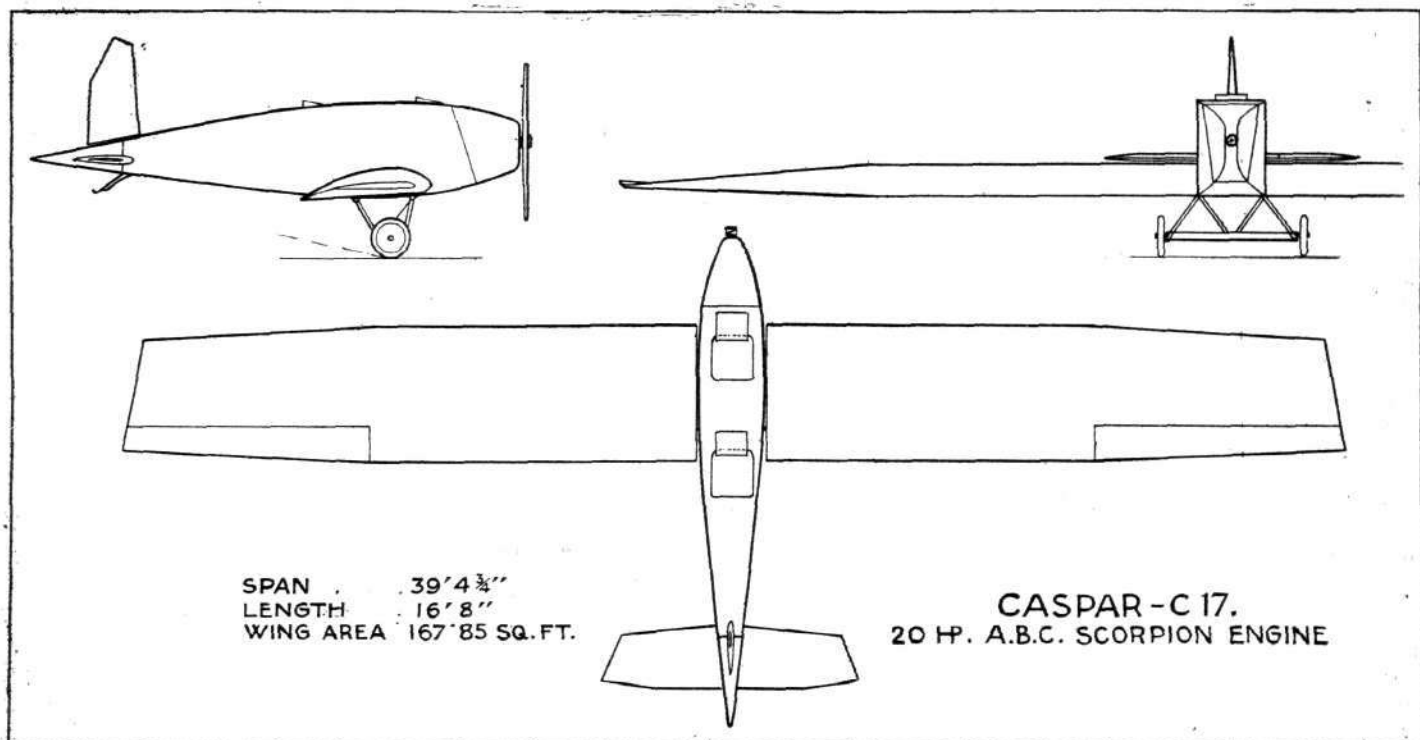
Constructionally the Caspar "C.17" is of interest mainly on account of the principle employed of building up the machine as a series of complete units which, when finished, are attached to a central framework of steel tubes, which forms the backbone of the machine and serves as a central point of attachment for fuselage, wings, engine unit, undercarriage and the weight of pilot and passenger.

The fuselage is of rectangular section, and consists of a framework of stringers with planking of three-ply wood. All stringers are of the same triangular section as used in the wing, and the fuselage struts, which are arranged to form a triangulated structure, are of the same section. At the

and bottom for engaging with the slotted steel plates, is a feature of all Caspar machines, and is employed for making a quickly-detachable joint where a wing is built in several sections. The addition of the springs is, however, new. Herr Meyer states that during the test flights which he carried out the sprung wings were found to render the machine particularly insensible to gusts, steady flight being maintained even on a very "bumpy" day. Whether the other object of this wing arrangement, *i.e.* to take advantage of pulsation and to gain extra lift therefrom, was attained is not stated, and, in any case, it would appear that the amount of extra lift that can be obtained in this manner must be too small to be easily noticeable.

The A.B.C. "Scorpion" engine is mounted on a metal frame work and drives a Bork airscrew of 1.2 m. (3 ft. 11 ins.) diameter. The amount of fuel carried is sufficient for 2 to 2½ hours. It is stated that the engine has a power output of 30 h.p. at 3,200 r.p.m., and during test flights it was found that the machine would fly without losing height with the engine throttled down to 2,200 r.p.m., corresponding to approximately 16 h.p. The amount of reserve power should, therefore, be satisfactory, and allow of normally flying with the engine throttled.

The empty weight of the machine is 145 kgs. (320 lbs.), and the total loaded weight (with a useful load of 180 kgs.) is



THE CASPAR "C.17" LIGHT MONOPLANE: General arrangement drawings, to scale.

stern the fuselage proper terminates in a rectangular frame, to which the elevator and rudder are hinged, and which carries the tail skid. The streamline is maintained by a Duralumin pyramid bolted to the stern frame, the elevator being divided to clear it. There is no fixed tail plane, nor any vertical fin in front of the rudder, which latter is mounted above the fuselage.

The wing has two box-section spars, placed relatively close together, and the total number of ribs, as well as the number of different ribs, has been kept as small as possible for the sake of cheapness. Thus the rib spacing is 0.8 to 1 m. (2 ft. 7 ins. to 3 ft. 3 ins.), and there are but three different sizes of ribs. The space between the two main spars is braced by tubes running from the lower edge of the front spar to the top edge of the rear spar, as shown in the illustration, while another series of tubes run from about the neutral axis of the rear spar to the trailing edge. The wing covering is in the form of three-ply attached to the widely-spaced ribs. Stringers running parallel with the spars stiffen the covering against local buckling.

Reference has already been made to the springing of the wings. One of our illustrations shows the springs on the inner ends of the wing spars. The wings pivot around a point just aft of the front spar, the fitting being shown in the photograph. The long bolt, with wedge-shaped nuts at top

and bottom for engaging with the slotted steel plates, is a feature of all Caspar machines, and is employed for making a quickly-detachable joint where a wing is built in several sections. The addition of the springs is, however, new. Herr Meyer states that during the test flights which he carried out the sprung wings were found to render the machine particularly insensible to gusts, steady flight being maintained even on a very "bumpy" day. Whether the other object of this wing arrangement, *i.e.* to take advantage of pulsation and to gain extra lift therefrom, was attained is not stated, and, in any case, it would appear that the amount of extra lift that can be obtained in this manner must be too small to be easily noticeable.

On starting for the first test flight, Herr Meyer states that the machine got off in 60 m (67 yards) against a wind of 4 to 5 m. per second, and on a second attempt this distance was reduced to 40 m. (45 yards). The first time the machine was flown with a passenger (Herr von Loessl) on board it had to take off in a cross wind, and the run required was then less than 80 m. On another occasion, and piloted by another pilot, the C.17, again carrying a passenger, reached an altitude of 1,450 m. (4,750 ft.), but could be taken no higher on account of clouds. The estimated ceiling is 3,500 m. (11,500 ft.). The landing speed is 50 to 55 kms./hour (31 to 34½ m.p.h.). Assuming a maximum power of 30 b.h.p., the power loading of the Caspar C.17 is 23.85 lbs./b.h.p., while the wing loading is 4½ lbs./sq. ft.

LIGHT 'PLANE AND GLIDER NOTES

Those wishing to get in touch with others interested in matters relating to gliding and the construction of gliders are invited to write to the Editor of FLIGHT, who will be pleased to publish such communications on this page, in order to bring together those who would like to co-operate, either in forming gliding clubs or in private collaboration.

LAST week we were able to announce in these notes that a meeting was to take place at the Air Ministry between representatives of six light aeroplane clubs and the Director of Civil Aviation. The conference took place on Friday of last week, Air Vice-Marshal Sir W. Sefton Branncker being present and the clubs represented being as follows: The Royal Aero Club (Lieut.-Col. M. O. Darby and Lieut.-Commander H. E. Perrin), Glasgow Light Aeroplane Club (Mr. J. Allison, jun.), Midland Aero Club (Major Gilbert Dennison); Lancashire Light Aeroplane Club (Mr. C. J. Wood and Mr. D. R. Williams), Yorkshire Light Aeroplane Club (Professor G. Brodetsky and Mr. Norman Blackburn). The sixth club, the Newcastle Light Aeroplane Club, was prevented from sending a representative, but will confer with the Air Ministry later.

No official announcement has been made concerning the conference, but it is understood to have been of a more or less informal character, and to have taken the form of an elaboration by the Director of Civil Aviation of the details of the Air Ministry proposal, followed by a discussion of various matters relating to finance, conditions of membership, suitability of light 'plane types for school and club purposes, and other similar subjects. Although no definite results were obtained, it is felt that the conference has done a great deal of good in bringing together the parties concerned, and the representatives of the various clubs were quite enthusiastic in regard to the future of the light 'plane movement.

It would appear that among those interested in the formation of light 'plane clubs there is still a good deal of diversity of opinion as to the size of engine required. In the meantime the Air Ministry is looking into the problem, and it is thought that a ruling on the subject will be issued before long. It is, however, a problem requiring the most careful consideration, as the whole future of the light 'plane movement may very well be marred by a wrong decision.

In aircraft circles there is a growing tendency to regard 35 to 40 actual horse-power as sufficient for light 'plane two-seaters, and a feeling that to increase the cubic capacity would be a retrograde step, merely leading to a repetition of the early history of flying, when an increase in performance was obtained mainly by increasing the engine power instead of by improving the aerodynamic efficiency of the machines. It is felt that with modern knowledge of aeronautics it should be possible to design machines with ample power reserve without increasing the power to more than 40 b.h.p. Certainly, the performance curves of the Beardmore "Wee Bee I," and the figures relating to the German Caspar "C.17," published in this issue of FLIGHT, appear to indicate that efficient two-

seaters can be built which will fly with the engine developing 10 to 15 b.h.p., so that if the maximum power is about 40 b.h.p. there should be a percentage reserve better than that attained in most commercial aeroplanes.

As against the "efficiency school," there is a volume of opinion which maintains that if light 'planes are to become popular they will, above all else, need to be cheap. Now super-efficiency and cheapness are always more or less antagonistic, but in this case it should not, we think, be impossible to combine the two so as to form a workable compromise. New methods of construction must be evolved to meet the case. Merely to build an ordinary aeroplane on a reduced scale will not bring the cost down, as the number of man-hours will be very nearly the same as for a much larger machine. The use of inferior materials is out of the question, and so there can be small chance of reducing the cost that way. The only solution, therefore, appears to be to adhere to high-class materials, but to use them in such a way as to minimise the amount of work needed to join them together to form a machine. In this respect the Caspar "C.17" appears to point the way. For instance, the number of wing ribs has been reduced to the very small total of 10 for the whole wing, and, although the wing tips are tapered, there are but three different sizes of ribs, those of the parallel portion, the wing tip ribs, and one rib between the tip and the parallel centre portion.

As a matter of fact, while on the subject of tapered wings, there are designers who are of the opinion that even the plain untapered wing, with "sawn-off" tips, is not so very inferior as regards efficiency to the tapered wing, while its cost is necessarily smaller.

SIMILARLY, in the case of the fuselage, the use of numerous metal fittings for diagonal bracing wires or rods must add to the cost, not only of manufacture, but even more so of erecting one of the largest items in the cost of an aeroplane. In the Caspar the longerons and struts are all of the same triangular section, and the fuselage is of the flat-sided, flat-topped variety, with no such costly refinements as deck fairings, etc. Yet the machine appears to be a very efficient one.

At the glider meeting held in Czechoslovakia recently several fine performances were put up, and the "record" of the meeting was established by Major Skala, who, mounted on one of the Dewoitine gliders, delivered by Lieut. Thoret to Czechoslovakia last year, remained in the air for 2 hrs. 21 mins. 51 secs. A number of gliders of Czechoslovak design and construction also took part, but, although they performed quite creditably, they did not equal the duration of the Dewoitine. One or two of them were damaged, but no serious accidents occurred. It may be recollected that when Lieut. Thoret visited Czechoslovakia last year one of his most apt pupils was Major Skala, who has now established a new glider "record" for his country.



THE PARNALL "PIXIE III" LIGHT 'PLANE: This photograph shows the machine in monoplane form, but it will be recollected that it can be converted into a biplane, and that, as a matter of fact, it flew in this guise at Lympne. The machine shown is that carrying the number 18 in the competitions. Mr. Frank Courtney is in the pilot's seat, and Mr. Harold Bolas is the passenger on this occasion.

THE BALTIMORE NAVY-SEAPLANE MEETING

On October 26 last, a successful race meeting for seaplanes was held at Baltimore, U.S.A., and through the courtesy of our American contemporary *Aviation* we give below a brief report of the proceedings:—

This meeting was organised for U.S. Naval Seaplanes by the Flying Club of Baltimore in co-operation with the Naval Air Committee of the Bureau of Aeronautics of the Navy, and, to a certain extent, took the place of the Schneider Cup Seaplane race, which was to have taken place at Baltimore about the same time. According to reports, the effort on the part of the U.S. Navy (Air) to give a good "show" to make up for the postponed Schneider Cup Race was met with some considerable success, and not only did they provide the material—men and machines—for some thrilling racing, but they put all strict service discipline aside and entertained the guests of the Club with true naval courtesy.

Thanks to the United Railways and Electric Company, an ideal site for the meeting was secured at the amusement resort Bay Shore Park, which borders on Chesapeake Bay, about 14 miles from Baltimore but within easy access. A long pier extending out into the Bay made a perfect grand stand, from which every event could be witnessed with ease. It is estimated that some 15,000 people assembled at the Park to see the races, while many civilian seaplanes lined up along the shore added further interest, and also offered opportunities for joy-rides. Weather conditions were ideal, both for pilots and spectators.

There were a dozen events down on the programme, and during the "flying off" of these it is claimed that 13 new records were established. The most important of the events was a speed race between the two Curtiss CR 3 seaplanes, which captured the Schneider Cup last year. These two machines were fitted with Curtiss D 12 engines, and were piloted by Lieuts. Ralph A. Ofstie and G. T. Cuddihy. They flew over the Schneider Cup course, and attempted to better the 500 and 3 km. records. Both machines retained their respective distances practically throughout the race, and the start and finish took place within full view of the spectators. Lieut. Ofstie broke three world's records in this event, as follows: 100 km., 176.82 m.p.h.; 200 km., 177.29 m.p.h.; and 500 km., 161.13 m.p.h. Thus, the first record was increased by 47.07 m.p.h. (previous record, Biard, 129.75 m.p.h.), the second by 7.4 m.p.h. (previous record, Rittenhouse, 169.89 m.p.h.), and the third by 87.72 m.p.h. (previous record, Wead and Price, 73.41 m.p.h.).

Lieut. Cuddihy then flew the 3 km. course and created a new world's seaplane record of 189.66 m.p.h., an increase of 15.59 m.p.h. over the previous record, by Passaleva (Italy), of 174.07 m.p.h.

Another important event was the Baltimore Sun Trophy race, a handicap race over a 12-lap course, a total distance of 80 miles. Six machines entered for this event as follows: E. Nirmaier and W. A. Regan, both on Curtiss MF's with C6 engines, H. O. Hollingshead on a similar machine fitted with an OX5, E. Keddie on another MF with a K6 engine, H. Rogers on a Loening air yacht, F. Mills on an Aeromarine 39B. There was some delay in starting the machines owing to the fact that the Curtiss racers were still in the air when this event was due to commence, while it took some time to get the machines lined up and away. The machines were in view of the spectators throughout the race, and owing to the wide difference in speed much excitement was provided by the consequent "passing" of the various competitors.

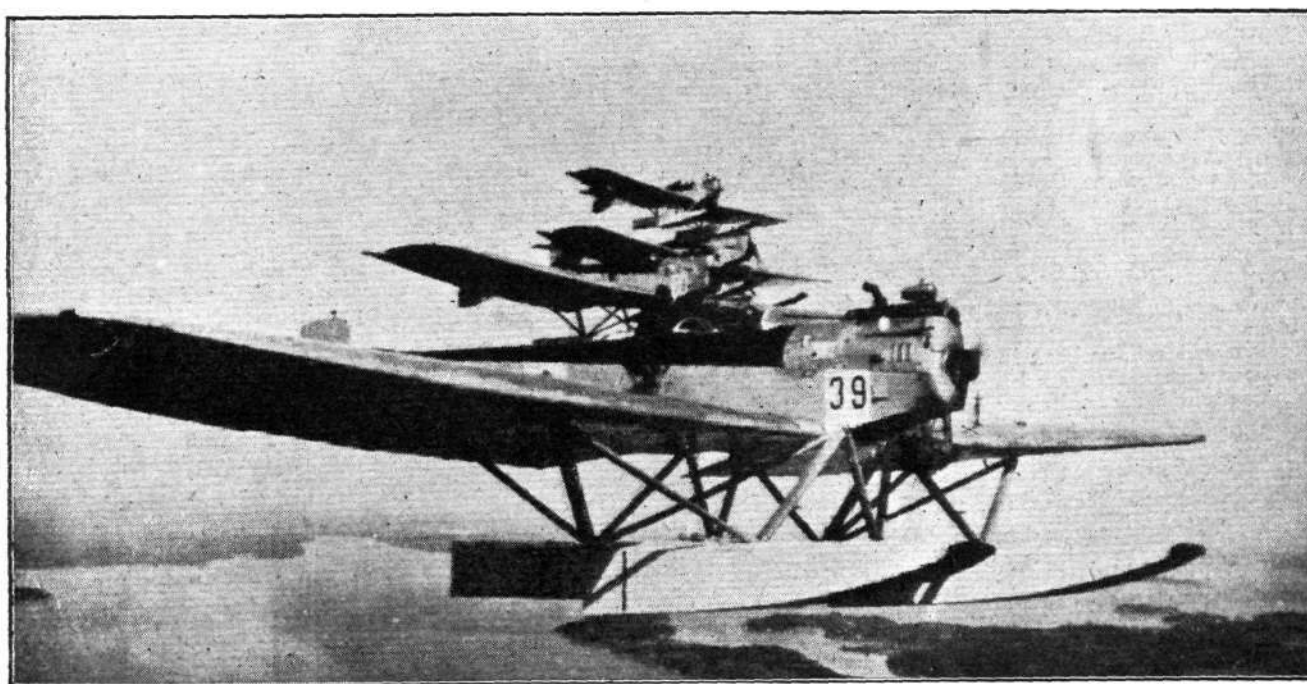
This event was won by Nirmaier with a speed of 76.18 m.p.h., Regan was second with 74.05 m.p.h., and Hollingshead third with 63.52 m.p.h. Keddie and Rogers finished fourth and fifth respectively, Mills on the Aeromarine dropping out on the 11th lap.

Before this race came to a close another event was started, as it was getting late and dark. This was the Torpedo Plane race, over eight laps of the course—52.28 miles—in which four Douglas torpedo planes started, T2, T8, T10 and T11. At the finish it was almost dark, and at times only the tail lights of the machines and the flare of their exhausts were visible. This event was won by Lieut. McKay in the T11 with a speed of 80.88 m.p.h., Lieut. Patterson on the T10 being second with 76.38 m.p.h. The other two competitors were forced down by engine trouble. Of the other events mention may be made of the efforts put up for the seaplane distance and duration records by Lieuts. G. Henderson and O. B. Hardison, both flying PN7's fitted with Wright T3 engines. Subject to verification the following records were established by these two pilots: Lieut. Henderson—Duration (1,000 kgs.), 5 hrs. 28 mins. 43 secs.; distance, 400 kms. (248 miles); speed (100 kms.), 126.345 kms. p.h.; (200 kms.), 126.345 kms. p.h. Lieut. Hardison—Duration (2,000 kgs.), 1 hr. 49 mins. 11.9 secs.; distance, 100 kms.; speed (100 kms.), 110.08 km. p.h.; distance (1,500 kgs.), 150 kms.; speed (1,500 kgs., 100 kms.), 110.39 kms. p.h.

Royal Aeronautical Society

Lecture.—The next meeting of the Royal Aeronautical Society will take place in the Society's Library, 7, Albemarle

Street, at 5.30 p.m., on Thursday, November 27, when Dr. G. C. Simpson, C.B.E., F.R.S., Director of the Meteorological Office, will read a paper on "Thunder Storms and Aviation."



FORMATION FLYING IN SWEDEN: Our photograph shows one side of a formation of S.II Svenska Aero A.B. seaplanes during practice. The photograph, which was taken from the Squadron-Leader's machine, shows typical Swedish "country" below.

AIR MINISTRY NOTICES

Croydon Aerodrome : Aircraft Departure Signal

The signal whereby aircraft are given permission to "Take off" at the Croydon aerodrome is now as follows :

When the aircraft is visible from the Control Tower, permission to depart will be given from the Tower by an orange coloured light directed at the aircraft specified. When the aircraft is not visible from the Tower, a red flag will be waved from a position visible to the pilot of the aircraft.

(No. 109 of 1924.)

Publication of "The Air Pilot: Great Britain"

1. INFORMATION regarding the conditions affecting civil aviation in this country, and the facilities available, is contained in an Air Ministry publication entitled *The Air Pilot: Great Britain*, which has been published today by H.M. Stationery Office, price £1 12s. 6d. net.

2. *The Air Pilot* has a loose-leaf system of binding to facilitate the insertion of amendments and additions. The scope of the book is indicated by the following brief synopsis of the contents :—

Chapter I.—Regulation and Administration of Civil Aviation.
Historical and International—International Convention for Air Navigation—Air Navigation Act, 1920—Air Navigation Orders and Directions—Registration of Aircraft and Certificates of Airworthiness—Licensing of Personnel—Licensing of Aerodromes, etc.

Chapter II.—General Information and Instructions.
Insurance—Visas—Warnings issued by W/T—Notification of landing on Overseas flights—Swinging of aircraft compasses, etc.

Chapter III.—Climate.

Characteristics of the climate of Great Britain.

Chapter IV.—Pilotage Directions.

Air Routes—Customs—Prohibited Areas—General Safety Provisions—Danger Areas—Special warnings—Air Pilotage Marks—Visual signals—Lighthouses, etc.

Chapter V.—Air Stations.

List and classification of Air Stations—Conditions governing use of Government aerodromes and scale of charges—Indication of bad ground at Government aerodromes—Air Station schedules, comprising detailed descriptions and maps of all air stations open to civil aircraft in Great Britain.

Appendix.—Wireless and Meteorological Services for Civil Aviation.

Details of the Wireless and Meteorological organisations available in Great Britain and neighbouring countries over which British machines regularly fly.

3. *The Air Pilot* is complementary to the British General Sheet (provisional) of the International Aeronautical Map (G.S., G.S. (Air) 113).

4. *The Air Pilot* and the British Sheets of the International Aeronautical Maps will be corrected and kept up-to-date by a monthly publication entitled *The Air Pilot Monthly Supplement* and by Notices to Airmen. The Monthly Supplements will contain, in addition to corrections to *The Air Pilot* and the maps, information with regard to facilities for civil aviation abroad and announcements in connection with the licensing of civil aviation personnel, etc. The Notices to Airmen will be confined strictly to urgent matters.

5. The Monthly Supplements will be supplied free of charge by H.M. Stationery Office to purchasers of *The Air Pilot*. No change will be made in the present method of distributing Notices to Airmen.

6. The Notices to Airmen issued up to date fall into three classes :—

(a) Notices which have been incorporated in *The Air Pilot* and are hereby cancelled.

(b) Notices which have already been notified as cancelled, or which need no longer be retained.

(c) Notices, mainly relating to foreign countries, which will remain in force.

A list of the cancelled Notices (a) and (b) and of the Notices



Memorial to First Air Record

On November 12 last, a granite column was unveiled in the Bois de Boulogne at Bagatelle, to mark the spot where, exactly 18 years ago, the Brazilian aviator, Santos Dumont, created the first official record for a flight with a heavier-than-air machine. The ceremony was performed by M. Laurent Eynac, French Under-Secretary for Air, and M. Santos Dumont was himself present. This flight, which was recorded at the time in our sister journal, *The Automotor Journal*, for November 17, 1906, and was illustrated in the following issue

remaining in force (c) is given in an Index to Notices to Airmen issued simultaneously with this Notice.

7. Notices to Airmen (or portions thereof) the substance of which is incorporated in issues of the Monthly Supplement will be notified as cancelled in a monthly amendment to the Index to Notices referred to above.

8. *The Air Pilot* is obtainable at the following Sales Offices of H.M. Stationery Office :—

London, Adastral House, Kingsway, W.C. 2 ; and 28, Abingdon Street, S.W. 1. Manchester, York Street. Cardiff, 1, St. Andrew's Crescent. Edinburgh, 120, George Street ; or through any bookseller.

The Britain General Sheet of the International Aeronautical Maps may be purchased (price 4s., paper ; 4s. 6d., linen-backed) at the Map Agents, and also at the Sales Offices of H.M. Stationery Office, above mentioned.

No. 114 of 1924.

Manchester Aerodrome

1. MANCHESTER (Alexandra Park) aerodrome having been relinquished, the following amendments are made to the *Air Pilot: Great Britain* :—

Page 42, List A, delete "Manchester (C)." .

Pages 117-119, delete Schedule with map and plan of Manchester.

2. A site for an aerodrome at Woodford, near Manchester, has been acquired by A. V. Roe and Co., Ltd. The following particulars of this site are available :—

Class.—Private aerodrome (at present unlicensed).

Position.—Latitude 53° 20' N., Longitude 2° 09' W. Situated N. of River Dean, $\frac{3}{4}$ mile S.E. of the village of Woodford, 3 miles E. by N. of Wilmslow and 10 $\frac{1}{2}$ miles S.S.E. of the centre of Manchester.

Description.—The surface is at present mixed farm land, but is suitable for use by small aircraft, and will ultimately be suitable for all types of machines.

Height above sea level.—300 ft. approx.

Accommodation, etc.—Three large hangars are being transferred from the old aerodrome at Alexandra Park. No petrol, oil, repair facilities or personnel are available.

Owners.—A. V. Roe and Co., Ltd., Newton Heath, Manchester.

3. A detailed schedule with map of the new aerodrome will be published in the *Air Pilot Monthly Supplement* when the organisation of the aerodrome is more complete.

(No. 115 of 1924.)

GROUND ENGINEERS.

Inspectional Markings on Aircraft and/or Aero Engine Details and Components

1. ALL aircraft for which an Air Ministry Certificate of Airworthiness is desired are required to have all detail parts and components suitably marked in accordance with the provisions of paras. 20 and 21 of A.N.D.3. These markings take the form of legible impressions of a stamp on the part or component whereby the individual responsible for the inspection thereof may be readily identified. Similarly, when repairs, replacements, or overhauls are undertaken to aircraft in possession of an Air Ministry Certificate of Airworthiness, Ground Engineers licensed in categories B. and D. must ensure that all new detail parts and components used on the aircraft bear inspectional markings.

2. These inspectional markings signify :—

(a) That there is definite evidence that all materials used and the processes of manufacture involved have been previously approved by an authorised inspector (see Notice to Ground Engineers No. 7 of the year 1922) ;

(b) That the material is free from defects so far as can be determined by visual examination ;

(c) That the workmanship is satisfactory as regards quality, truth and final assembly ; and

(d) In the case of assembled components that the assembly is complete and bears the necessary inspectional markings.

(No. 10 of 1924.)



(November 24), was made in a "Canard" or tail-first box-kite arrangement driven by a 24 h.p. Levavasseur engine. The machine flew 220 m. (240 yds.) at a height of about 20 ft., and remained in the air for 21 $\frac{1}{2}$ sec. By this flight, Santos Dumont won the Archdeacon Cup.

Basra War Cross

AIR-COMMODORE DOWDING, on November 11, unveiled a War Cross erected by the Imperial War Graves Commission, as Basra Cemetery—the service being held at a parade of Royal Navy, Army and Royal Air Force units.

THE PREVENTION OF FIRE IN AIRSHIPS

COMMANDER F. L. M. BOOTHBY, whose name is well known to our readers in connection with Airship design, has expressed the following interesting views in a letter to the Press, dealing with the very important point of the prevention of fire in airships. He says the great danger from petrol fumes has been overcome by the adoption of an engine consuming heavy fuel in conjunction with hydrogen. There remains the danger of fire to gas. This may arise from lightning, spontaneous combustion of oil rags left near the gas-bags, smoking in unauthorised places, etc. That the danger is real enough is shown by the following letter received by Commander Boothby from Major Stelling, the German pilot who carried out the trials of the first British Naval airship to be commissioned when she was purchased from the Parseval Company by the Admiralty before the War:—

"Dear Boothby,—In reply to your letter of September 25, I inform you that as far as I can remember the following ships are burnt:—The Navy airships L.2, L.10, S.L.8, and P.L.26. L.10 and S.L.8 were destroyed by lightning—L.10 over the North Sea 1915, S.L.8 over the Baltic 1917. L.2 was burnt during the trials in Johannisthal before the War. The fire was caused by inflammation of hydrogen, which poured from the valves into the engine car. P.L.26 was burnt in the shed at Bitterfeld, 1915. A big accident occurred 1917 in Ahlhorn, where four airships and four sheds were destroyed by explosion of hydrogen.—Your sincerely, A. STELLING."

In this country we lost N.S.11, struck by lightning, C.11 through a fire over the Humber, and S.S.1 from a collision with telegraph wires.

There is a simple method of dealing with this trouble, which is to exclude the oxygen of the air from the neighbour-

hood of the hydrogen by inserting a layer of inert gas between the two. Anyone can test the efficiency of the system by putting a layer of exhaust gas from his motor-car round a tin of petrol, and then firing incendiary bullets or Verey lights into it. Our authorities do not seem to be alive to this danger of fire in the new passenger ship ordered.

In the White Paper giving such details of the contract as are available, some 15 tons more weight is allowed for the hull structure than would be required by experienced designers, but no compensating advantage of gas protection is mentioned. There is ample time to arrange for this, as the delivery date of the airship is September, 1927 (the Germans assembled their large ships in ten weeks during the War), and the necessary provision could be made for the addition of gas-armour in the next Air Estimates. If this is done the programme begun under the auspices of the late Air-Commodore Maitland will be completed, though four years later than would have been the case had not the old airship service been destroyed. This programme started with perfecting the mooring mast, so as to allow airships to operate in any weather; to abolish the use of petrol, and cheapen cost of running, so that commercial air lines could operate without a subsidy. The final stage was so to protect the gasbags that an airship could be struck by lightning again and again without catching fire. Given this, the new generation of airship officers, who must shortly arise, will have an implement to their hand suitable for welding the Empire.

The building of commercial airships which are not rendered as safe as possible in every way is a waste of money, as the public will not travel by them, except by way of an adventure, and the air line will not pay.

Air Ministers' Secretaries

THE Right Hon. Sir Samuel Hoare, Bart., C.M.G., M.P., Secretary of State for Air, has appointed Mr. C. L. L. Bullock to be his principal private secretary, and Flight-Lieut. G. W. Dobson and Mr. Paul E. Paget (unpaid) to be his assistant private secretaries. He has further appointed Sir Geoffrey Butler, K.B.E., M.P., to be his Parliamentary private secretary (unpaid).

Sir Philip Sassoon, Bart., G.B.E., C.M.G., M.P., Under-Secretary of State for Air, has appointed Mr. P. J. Oldfield to be his private secretary.

Amsterdam-Batavia Flight

THE "Flying Dutchmen," led by M. van der Hoop, who are flying from Amsterdam to Batavia (Java) on a Fokker monoplane (Rolls-Royce "Eagle IX"), are now nearing the end of their journey. On November 12 they departed from Ambala—which they reached the previous day—and arrived at Allahabad, having passed over Delhi en route. They left again next morning and reached Calcutta in the afternoon. On the 14th they left Dum Dum aerodrome, Calcutta, at 7.15 a.m., and arrived safely at Akyab at 1.35 p.m. The weather conditions were ideal. On Saturday morning, November 15, they proceeded to Rangoon.

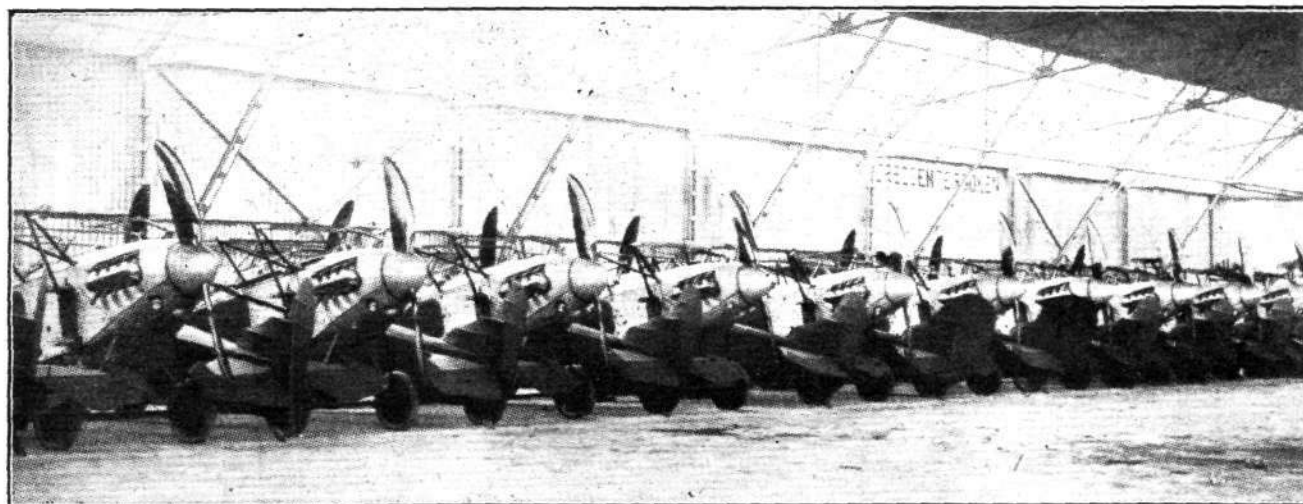
Arriving there, they found the racecourse crowded and a race in progress, and after circling round several times at a low altitude, they finally made for a spot about 7 miles away, where they landed. The following morning they completed the somewhat tricky section from Rangoon to Bangkok.

Zeppelin Works for Spain

IT is reported that an agreement has recently been made between the Zeppelin Co. and the Compania Transaera Española whereby the greater part of the Zeppelin works at Friedrichshafen will be transferred to Seville, where Zeppelin airships will be constructed. Four ships, it is said, of 130,000 cu. m. are to be started on at the earliest opportunity.

Successful Trials of "E.E.C." Flying Boat

TRIALS were carried out on November 13 at Lytham with a new flying boat built by the English Electric Co., Preston, for the Air Ministry. It was piloted by Major W. G. Brackley, D.S.O., who, after the machine was successfully launched, took the machine up to 1,400 ft., with a load, including a crew of three, of 14,200 lbs. It took off easily within 25 secs., and attained a speed of about 95 knots. This flying boat, which is, we believe, called the "Kingston," is fitted with two Napier "Lion" engines.



PEACETIME PRODUCTION: A view inside the Fokker works at Amsterdam, showing a batch of Fokker D.XIII single-seater chasers. These machines, a specimen of which will be exhibited at the Paris Aero Show, are fitted with Napier "Lion" engines.

AN AERIAL TOUR TO INDIA

AN important flight from London to India has just been planned, and will probably commence one day next week. Alan J. Cobham, the famous long-distance air-taxi champion, will be the pilot, while the passenger will be none other than Air Vice-Marshal Sir Sefton Brancker, our energetic Director of Civil Aviation, who seems to live in the air. The machine, of course, will be the D.H.50 (Siddeley "Puma"). The objects of this enterprise—for which the Air Ministry and the British aircraft industry are jointly responsible—are, in the main, twofold. In the first place it is intended to survey the aerial possibilities of a route to India. Secondly, on arriving in India, the Director of Civil Aviation will be able to attend the conference with the Indian Government in January next for the purpose of settling the various matters connected with the big airship scheme now under development—the site, erection, etc., of the airship base in India.

It should be noted that no attempt at "record flights" will be made on this trip, for inasmuch as a great deal of varied information will have to be collected *en route*, the journey must necessarily occupy some time—probably about two months. Furthermore, Sir Sefton is anxious to study very closely possible new air routes, over which Imperial Airways, Ltd., may extend their services, while the question of the use of aeroplanes as feeders to the airship route will also form an important item requiring investigation.

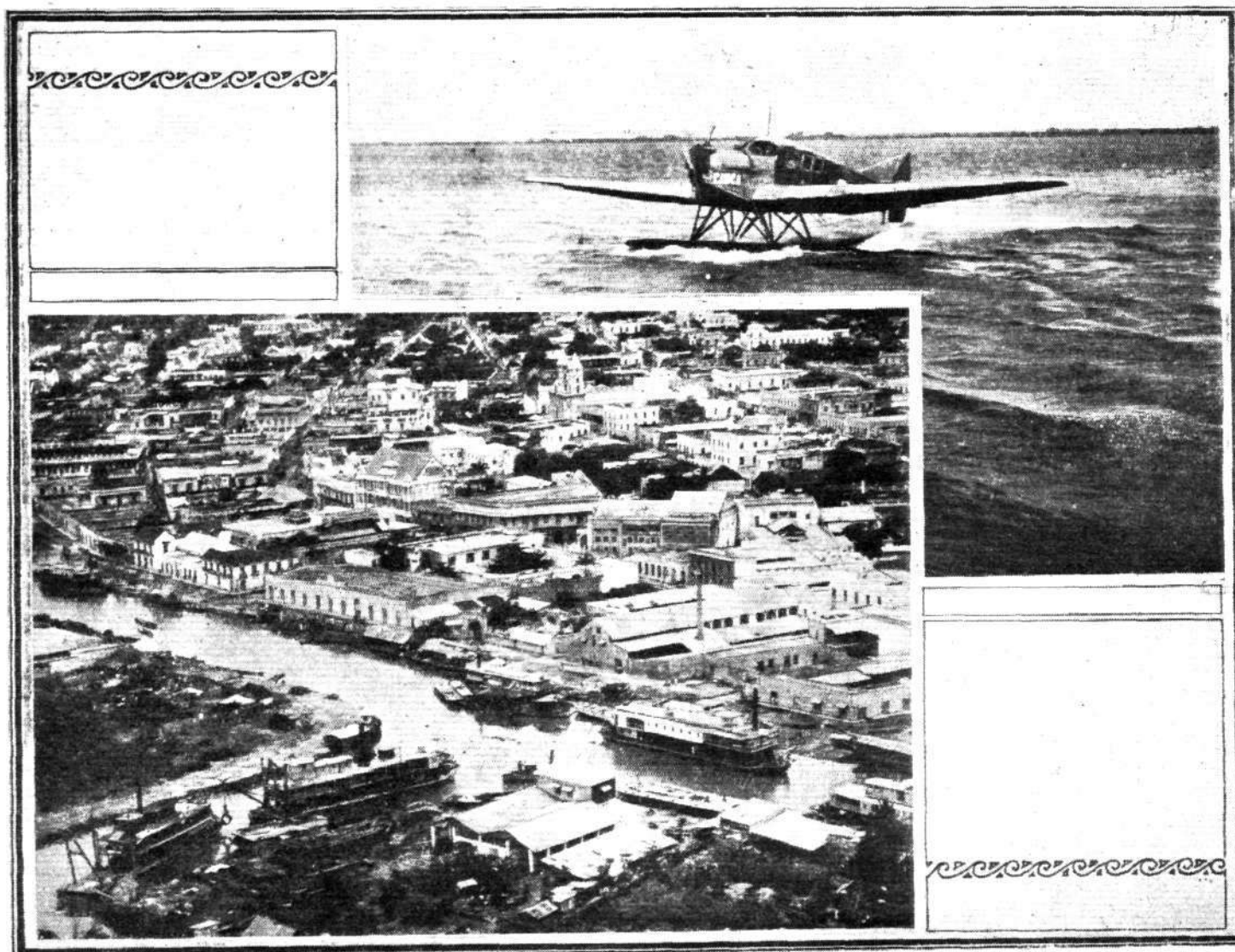
The route to be taken on this aerial tour—which will cover some 14,000 miles—will include Paris, Berlin, Warsaw, Bucharest, Constantinople, Angora, Aleppo, Baghdad, along the Persian Gulf to Karachi, and Calcutta. Many divergencies will, of course, be made here and there.

During Sir Sefton's stay in India the D.H.50 will, in all probability, give a series of demonstration flights in order to "show off" its admitted excellent qualities.

Graphical Methods of Aircraft Structural Design

READERS are reminded that it is tomorrow, Friday, November 21, that Dr. A. P. Thurston is reading his paper on "Graphical Methods in Aircraft Structural Design," before the Institution of Aeronautical Engineers. The subject is one that should appeal especially to those actively engaged in our aircraft drawing offices, and we would recommend all who can possibly do so to attend the meeting. Dr. Thurston has had very long experience of structural design, and was at one time in charge of this section at the Air Ministry.

At the same time he is not likely to prove tied down by such routine methods as may obtain at the Ministry, and is sure to introduce innovations. Graphical solutions, if of reasonable accuracy, are often to be preferred owing to the ease with which errors become apparent. For that reason, and also because the Institution of Aeronautical Engineers can now be said to have attained a position where it must be taken seriously, the meeting deserves a very full attendance. The meeting will take place at the Engineers' Club, Coventry Street, and will commence at 6.30 p.m.



AIR MAIL SERVICES IN COLOMBIA: In our issue for October 23 we published a report on the successful air mail services operated in Colombia by the "Scadta." Above we reproduce two photographs, one showing an aerial view of Barranquilla—the seaport terminus of the service—and the other showing one of the Junkers seaplanes, which are employed on portions of the service, starting from the Magdalena river for Bogota.

THE ROYAL AIR FORCE

London Gazette, November 11, 1924

General Duties Branch

The follg. are granted permanent commns. in ranks stated (Nov. 12):—
Flight Lts.—F. R. Alford, M.C., J. H. O. Jones. *Flying Offr.*—W. A. B. Buncart (Lt., R.A.).

Pilot Offr. H. V. Kerckhove, M.C., is promoted to rank of *Flying Offr.* (Oct. 15). The follg. *Pilot Offrs.* on probation are confirmed in rank (Sept. 15):—E. A. H. Fisher, R. A. Ford, H. R. Lowry. *Flight Lt.* A. C. Sanderson, D.F.C., is placed on half-pay, Scale B (from Nov. 14 to 25, inclusive); *Flying Offrs.* T. M. Shields, D.F.C., and A. F. McC. Riggs, M.C., take rank and precedence as if their appointments as *Flying Offrs.* bore date July 25, 1924 (reduction to take effect from Sept. 15, 1924); *Flying Offr.* J. Glover, takes rank and precedence as if his appointment as *Flying Offr.* bore date Aug. 2, 1919 (reduction to take effect from Oct. 18, 1924); *Group Capt.* H. P. Smyth-Osbourne, C.M.G., is placed on retired list on account of ill-health, and is granted hon. rank of Air Commodore (Nov. 12).

Stores Branch

The follg. are granted permanent commns. for accountant duties in ranks

stated (Nov. 12):—*Flight Lt.*—A. W. P. Phillips, O.B.E. (Lt.-Cdr., R.N., ret.). *Flying Offr.*—J. J. T. Rose.

Sqdn. Ldr. H. E. Rowley is removed from the R.A.F. (Nov. 12). The rank of *Flight Lt.* W. E. Fisher, M.C., is as now described, and not as *Gazette*, Nov. 4.

Reserve of Air Force Officers

S. W. Lummis is granted commn. in Class B, General Duties Branch, as a *Pilot Offr.* on probn. (Nov. 11); *Flight Lt.* D. A. Stewart, M.C., D.F.C., A.F.C., ceases to be empld. with Regular Air Force (Aug. 30) (substituted for *Gazette*, Sept. 2); *Pilot Offr.* W. Lowry is confirmed in rank (Nov. 6); *Flying Offr.* F. W. Knox is transferred from Class A to Class C (Nov. 11); *Flying Offr.* W. F. P. Williamson relinquishes his commn. on account of ill-health (Nov. 12). The follg. *Flying Offrs.* relinquish their commns. on account of ill-health, and are permitted to retain their rank (Nov. 12):—W. J. Rivett-Carnac, M.B.E., A. W. Higson.

Memorandum

Capt. S. H. Cleall, R.Irish Fus., is granted rank of *Maj.*, R.A.F., on retirement from Army.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Flight Lieutenants: A. H. Wann, to Sch. of Balloon Training, Larkhill; 11.11.24. R. S. Sugden, to No. 24 *Sqdn.*, Kenley; 17.11.24.

Flight Lieutenants: S. N. Cole, to No. 2 *Flying Training Sch.*, Digby, on transfer to Home Estab.; 27.10.24. W. H. Dunn, D.S.C., to R.A.F. Depot, on transfer to Home Estab.; 10.10.24. G. H. Harrison, to remain at Boys' Wing, Cranwell, instead of to R.A.F. Base, Calshot, as previously notified. M. L. Taylor, A.F.C., to Aircraft Depot, Egypt; 18.10.24. A. Latimer, W. A. K. Dalzell and J. H. Winch, to No. 4 *Flying Training Sch.*, Egypt; 18.10.24. H. Dawes, M.B.E., to Station H.Q., Kenley; 10.11.24. G. Bowen to No. 1 *Stores Depot*, Kidbrooke; 10.11.24.

Flying Officers: C. R. Smythe, G. F. Mackay, and H. E. Greenberry, to R.A.F. Depot on transfer to Home Estab.; 10.10.24. J. Glover, to No. 1 *School of Tech. Training (Boys)*, Halton; 10.11.24. J. R. D. Goadsby, to No. 58 *Sqdn.*, Worthy Down, on transfer to Home Estab.; 4.11.24. G. F. Blackburn, to No. 9 *Sqdn.*, Manston, on transfer to Home Estab.; 10.10.24. W. G. Nicholls, to No. 1 *Sch. of Tech. Training (Boys)*, Halton, on transfer to Home Estab.; 10.10.24. R. H. Haworth-Booth, D.F.C., to No. 32 *Sqdn.*, Kenley, on transfer to Home Estab.; 7.11.24. C. F. H. Grace, to No. 1 *Sch. of Tech. Training (Boys)*, Halton, on transfer to Home Estab.; 10.10.24. J. E. Doran-Webb, to No. 17 *Sqdn.*, Hawkinge; 5.11.24. J. L. Miles, to No. 1 *Flying Training Sch.*, Netheravon; 17.11.24. R. F. Casey, D.F.C., to No. 32 *Sqdn.*, Kenley; 10.11.24. J. Parsons, to Reception Depot, West Drayton; 10.11.24. G. N. Coward, to No. 100 *Sqdn.*, Spittlegate; 14.11.24. N. M. Firench, to Armament and Gunnery Sch., Eastchurch; 4.11.24. C. W. A. Scott, to remain at No. 32 *Sqdn.*, Kenley, instead of to Armament and Gunnery Sch., as previously notified; *Hon. Flight-Lieuts.* L. S. Ingle, M.C., and H. B. Holdway, to No. 27 *Sqdn.*, India; 3.10.24; *Hon. Flight-Lieuts.* F. M. Rooth and W. H. Vetch, to No. 60 *Sqdn.*, India; 3.10.24. D. E. Shaw, to No. 1 *Sch. of Technical Training (Boys)*, Halton; 14.11.24. H. F. Luck, to No. 1 *Group H.Q.*, Kidbrooke; 10.11.24. N. Liddall and H. Norington, to Aircraft Depot, Egypt; 18.10.24. B. M. T. S. Leete, E. F. Haylock, and C. Sutton, to No. 208 *Sqdn.*, Egypt; 18.10.24. F. W. Long, to No. 47 *Sqdn.*, Egypt; 18.10.24.

Flying Officers: W. S. Allen, to No. 41 *Sqdn.*, Northolt, on transfer to Home Estab.; 19.11.24. A. H. H. MacDonald, to Armament and Gunnery Sch., Eastchurch; 4.11.24. M. J. Ducray, to No. 207 *Sqdn.*, Eastchurch; 4.11.24. *Pilot Officers:* H. M. S. Wright, to No. 32 *Sqdn.*, Kenley; 10.11.24. H. L. R. Gough and J. A. Mollison, to No. 39 *Sqdn.*, Spittlegate; 10.11.24.

D. C. Burnley and C. N. A. B. Mumby, to No. 27 *Sqdn.*, India, instead of to No. 60 *Sqdn.*, as previously notified; 23.9.24. J. E. Townsend to Aircraft Depot, India, instead of to No. 27 *Sqdn.*, as previously notified; 23.9.24. J. F. Young, to Central *Flying Sch.*, Upavon; 14.11.24.

Stores Branch

Squadron Leaders: L. Auker, O.B.E., to Air Ministry; 10.11.24. W. J. B. Curtis, O.B.E., to R.A.F. Depot; 10.11.24.

Flight Lieuts. A. W. Turner, to H.Q., Iraq, instead of to *Stores Depot*, Iraq, as previously notified; 18.9.24. F. R. Wilkins, to Basrah Group, H.Q.; 16.10.24. E. Jones, to Aircraft Depot, Iraq, instead of to *Stores Depot*, Iraq, as previously notified; 18.9.24.

Flying Officers: D. W. Dean to *Stores Depot*, Egypt; 9.10.24. A. J. Moore (Accountant) to R.A.F. Trans-Jordan, H.Q., Palestine; 22.9.24.

Flying Officers: B. C. Powell (Accountant) to R.A.F. Depot, on transfer to Home Estab.; 19.10.24. A. S. Berry, to H.Q., India; 16.10.24. F. R. Barton (Accountant), to Central Accounts Office, Poona; 14.10.24. W. J. Cleasby and J. Mahoney, to *Stores Depot*, Egypt; 18.10.24. H. F. Webb, to No. 6 *Sqdn.*, Iraq, instead of to Aircraft Depot, Iraq, as previously notified; 18.9.24. J. J. T. Rose (Accountant), to No. 47 *Sqdn.*, Egypt; 22.10.24. H. Sleigh, to No. 99 *Sqdn.*, Bircham Newton; 17.11.24.

Accountants' Branch

Pilot Officers: C. E. Aston, H. J. Titherington, K. E. M. Holmes, J. McL. Murray, C. F. Goatcher, C. Lorimer, and E. Smith, to R.A.F. Depot on appointment to permanent commns. as *pilot officers* (on probation) for course of instruction in Pay Accounting; 10.11.24.

Medical Branch

Flight Lieut. (Hon. *Sqdn. Leader*) F. W. Squair, M.B., T.D., to No. 111 *Sqdn.*, Duxford; 10.11.24.

Flying Officers: A. Harvey, M.B., to Inland Area Aircraft Depot, Henlow; 10.11.24. J. B. Gregor and R. T. F. Grace, to Baghdad Combined Hospital; 18.10.24. L. P. McCullagh, to Station Commandant, Iraq; 24.10.24. S. G. Gilmore and R. H. Stanbridge, to Basrah Combined Hospital; 16.10.24. G. P. O'Connell, to Baghdad Combined Hospital; 19.10.24.

Chaplains' Branch

Rev. J. Black, O.B.E., M.A., to R.A.F. Depot, on appointment to an Honorary Commission without pay and allowances; 20.9.24. Rev. W. T. Rees to H.Q., Iraq; 30.9.24.

Skin Friction

THE paper on above subject read by Professor Bairstow before the Royal Aeronautical Society on November 13 was of necessity of a somewhat "mathematical" character, and it is not, therefore, proposed to publish the paper in *FLIGHT*. Those wishing to read it should obtain a copy of the Society's journal, where it, and the discussion, will be published in full. Professor Bairstow referred to Prandtl's "Boundary layer theory" as the "circulation theory of aerofoils developed by Prandtl and his school from suggestions by Lanchester," and called attention to certain defects in the theory. Reference was also made to certain experimental work carried out at home and abroad in order to test the theory, and Professor Bairstow came to the conclusion that the deductions from the boundary layer theory gave a rather poor approximation to the truth, and that an examination of the position suggested caution and the need for further inquiry. While this line of inquiry was one which he thought should be pursued, it was not one which could be regarded as satisfactory as at present derived. Fortunately, he concluded, the study of aerodynamics as a theory of fluid motion had now received international recognition, and progress was assured as a result of the primary interest of a number of individuals in this fascinating but very difficult subject.

Steel versus Lighter Alloys

At the lecture given by Col. Belaiew before the Institution of Aeronautical Engineers on November 7 the lecturer brought

forward several of the latest ideas on the structure of steel. By the lantern slides and their explanation he described in a very simple manner the formation of the grain in steel, and the similarity between this grain and that of timber. He showed how in old times the Eastern armourer, working with a high carbon steel (1.7 per cent.) was able to convert this steel into an elastic and ductile material by taking careful note of the grain formed by the dendritic crystallisation occurring during solidification, and the quality of the products was always judged on this formation. The lecturer pointed out how the same thing was done with regard to crankshafts, illustrating this by a slide of a Vickers crankshaft.

During the discussion Professor Carpenter enlarged upon several of these points, and among questions raised by other speakers was that of electro-magnetic action in the lighter alloys, and a new method of determining the quality of stainless steel bars by their electro-magnetic polarity. It was also pointed out that the direction of the grain and the formation of crystals in complicated steel castings could be arranged in the desired manner by passing an electric current through the molten metal.

Portuguese Airman Missing

At the time of writing it is reported that Senor Sacadura Cabral, the well-known Portuguese airman, who was attempting to fly from Holland to Portugal, disappeared when over the English Channel. All efforts to find any trace of him have so far been unsuccessful.

AIR POST STAMPS

By DOUGLAS B. ARMSTRONG
U.S. World-Flight Souvenir

THE final phase of the U.S. Army world-flight is represented by a special cancellation applied to letters despatched from the landing ground at Boston, where the flight was completed. It consists of the inscription "Boston—first landing in U.S. of World-Fliers" in a rectangular frame used in conjunction with a circular date stamp lettered "Boston, Mass., Airpost Station." The first mail to bear this souvenir postmark was despatched prematurely on September 5, on the strength of a report that the aviators were at hand, and comprised about 500 pieces of mail matter. The mail sent off on the actual day of landing (September 6) was even smaller, so that these historic covers are likely to prove scarce.

Holland-Java Air Post

WE learn from the well-informed *Air Post Bulletin* that the Dutch airmen who left Amsterdam for Batavia in the Fokker machine on October 1 carried with them 3 kilos. of official air mail, impressed with the special Dutch P.O. aerial cancellation "Vleigtocht Nederland-Indie 1.X.24. 8V." The supplementary fee for letters transmitted by this flight was 10 florins (18s.) per 20 grammes!

Latest Swiss Flights

THE latest addition to the ever-lengthening list of Swiss special flights emanates from Lausanne, where on the closing day of the Comptoir Suisse (September 28) the post office authorised a special air post to Zurich. Aerial correspondence was impressed on that occasion with a concentric circle containing the words "Lausanne Comptoir Suisse—Poste Aérienne 28.X.1924." The air mail was transported on the following day by the regular "Ad Astra Aereo" service, which made a special detour to Lausanne for the purpose.

Apropos of the semi-official air post stamps of Rangiers it is stated that this was issued under the auspices of the philatelic club of Delemont, whence the 20,247 letters, etc., were conveyed to Lausanne by the aviator, Capt. Balenco. Twenty-thousand copies of the stamp were printed by the firm of A. Trub et Cie. at Aaran, 16,000 of which were upon blue-grey and only 4,000 upon plain white paper.

A curious error occurred upon the seventh stamp in a few sheets (of 20) only, the aeroplane being entirely omitted from the design, due to a slight misplacement in the printing.

Early South African Aerogrammes?

WAS there an official air post service in operation in the Union of South Africa as far back as 1911? The question is prompted by an interesting cover that has been shown us by Mr. Alan Turton, who is informed that it was received by air at Bulawayo (Rhodesia) from Kimberley in that year. The envelope is an official pattern, blue in colour, and bears the significant word "AEROGAM" printed across the top. Postage is prepaid by an ordinary 1d. Transvaal stamp of King Edward reign. No other information is available at the moment, which will throw light upon this curious and hitherto unrecorded item.

U.S.A.

AT Dayton, Ohio, during the International Air Race Meeting (October 2-4, 1924), a special cachet was applied to a mail of air post letters despatched on Orville Wright Day, October 2, in connection with the American trans-continental system.

PERSONALS

To be Married

The engagement is announced between GERALD WILLIAM FERGUSON, M.C., A.F.C. (Indian railways), second son of the late H. T. Ferguson, M.I.C.E., and Mrs. Ferguson, of Bovey Tracey, Devon, and DOROTHY ESMÉ, youngest daughter of the Rev. H. BOURCHIER-WREY, and Mrs. BOURCHIER-WREY, of Ideford Rectory, Devon.

A marriage has been arranged, and will take place in December, between HARRY PUCKLE, D.F.C., the Leicestershire Regt., son of the late Colonel H. G. Puckle, Indian Army, and BEATRICE BERYL, second daughter of Mr. and Mrs. STANLEY AUSTIN, of Staplegrove Lawn, Taunton, Somerset, and late of Glastonbury Abbey.

The engagement is announced between the Rev. HARRY DAN LEIGH VIENER, C.B.E., M.A., K.H.C., Chaplain-in-Chief, R.A.F., late Chaplain, R.N., son of the late Mr. and Mrs. A. M. Viener, of Blackpool and Poulton-le-Fylde, grandson of the late Captain Young, R.N., of Ryde, and VIOLET MARGARET, second daughter of Mr. and Mrs. P. E. F. KEATCH, of Twickenham, late of India. The marriage will take place quietly in the New Year.

IMPORTS AND EXPORTS, 1923-1924.

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January 25, 1912; for 1912 and 1913, see "FLIGHT" for January 17, 1914; for 1914, see "FLIGHT" for January 15, 1915; for 1915, see "FLIGHT" for January 13, 1916; for 1916, see "FLIGHT" for January 11, 1917; for 1917, see "FLIGHT" for January 24, 1918; for 1918, see "FLIGHT" for January 16, 1919; for 1919, see "FLIGHT" for January 22, 1920; for 1920, see "FLIGHT" for January 13, 1921; for 1921, see "FLIGHT" for January 19, 1922; for 1922 see "FLIGHT" for January 18, 1923; and for 1923, see "FLIGHT" for January 17, 1924.

	Imports.		Exports.		Re-Exports.	
	1923.	1924.	1923.	1924.	1923.	1924.
Jan. ..	466	2,213	60,079	52,239	280	2,219
Feb. ..	641	920	120,236	26,349	3,040	335
Mar. ..	589	11,381	71,945	34,113	689	509
Apr. ..	8,508	373	167,757	56,998	462	6,014
May ..	845	3,426	55,427	125,138	728	4,162
June ..	1,433	1,219	141,381	87,629	1,410	2,115
July ..	192	1,510	62,025	179,292	1,334	2,708
Aug. ..	2,054	687	57,704	247,982	344	950
Sept. ..	578	4,383	39,069	67,749	106	641
Oct. ..	705	2,715	80,002	143,512	8,274	3,743
	16,011	28,827	855,625	1,021,001	16,667	23,396

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor
The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1923

Published November 20, 1924.

- 10,536. J. G. CURRIE. Aeroplanes and gliders. (223,613.)
- 11,108. A. PROCOPIEFF-SEVERSKY. Combination landing-gear. (223,618.)
- 13,611. J. DEMOCRATIS. Parachute. (233,623.)
- 19,221. GLOUCESTERSHIRE AIRCRAFT CO., LTD., H. P. FOLLAND and H. E. PRESTON. Shock-absorbers. (223,661.)
- 19,460. D. J. MOONEY and D. H. EMBY. Metal spars, etc. (223,670.)
- 22,162. H. JUNKERS. Float frames for seaplanes. (204,690.)
- 25,235. L. WATTIER. Hydro-aeroplanes. (205,491.)
- 27,220. V. C. RICHMOND and G. H. SCOTT. Ballasting of airships. (223,746.)

APPLIED FOR IN 1924

Published November 20, 1924

- 2,524. DORNIER METALLBAUTEN GES. and C. DORNIER. Constructional materials for aircraft. (210,784.)
- 2,834. A. B. F. SMITH. Doors for airship sheds, hangars, etc. (223,790.)
- 3,803. LUFTSCHIFFBAU ZEPPELIN GES. Airships having a bow frame. (212,882.)
- 16,148. S. A. REED. Air-propellers. (223,838.)

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The Aircraft Engineer and Airships

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